

REMARKS

Entry of the foregoing and favorable reconsideration of the subject application, as amended, pursuant to and consistent with 37 C.F.R. Section 1.112, and in light of the remarks which follow, are respectfully requested.

By the present amendment, Claim 1 has been amended to clarify that the methyl transferase is cyclopropane fatty acid synthase. Claim 12 has been amended to include the subject matter of Claim 32, which has been cancelled. Claim 34 has also been cancelled. Minor amendments have been made to Claims 17, 20, 30 and 31 for consistency purposes; i.e., the word "claim" has been capitalized. New claim 37 has been added. Support for this new claim appears at least in the examples. Applicants submit that this new claim should not be a new issue and hence the entry of this new claim is respectfully requested. Applicants reserve their rights to file a continuation application directed to the cancelled subject matter. Furthermore, Applicants submit that no new matter has been added via this amendment.

Claim 12 and Claims 13, 17 to 18, 20, 21, 30 and 32 to 34 dependent thereon, have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. This rejection should now be rendered moot due to the amendment. More specifically the subject matter of Claim 32, reciting specific promoters has been added to Claim 12. Therefore, this claim should be definite.

In view of the above, withdrawal of this rejection is respectfully requested.

Claims 1, 2, 12, 13, 17, 18, 20, 21, 23 and 30 to 34 have been rejected under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to convey to one skilled in the art, at the time the application was filed, that the inventors had possession of the claimed invention.

Solely to expedite the prosecution of the present application, and not to acquiesce to the Examiner's rejection, Applicants have amended the claims to recite a cyclopropane fatty acid synthase as the enzyme used to produce branched chain fatty acids. In view of this amendment, this rejection should now be rendered moot.

Therefore, in view of the above, withdrawal of this rejection is respectfully requested.

Claims 1, 2, 12, 13, 17 to 21, 23 and 30 to 34 have been rejected under 35 U.S.C. § 112, first paragraph, for lack of enablement. This rejection has been obviated-in-part by amendment and is being traversed-in-part.

In rendering this rejection, the Examiner purports that the specification is only enabled for those constructs which are set forth in the samples; i.e., production of branched chained fatty acids in tobacco plants using the enzyme cyclopropane fatty acid synthase. As set forth above, the claims have been amended solely to expedite the prosecution of the present application to recite the enzyme cyclopropane fatty acid synthase.

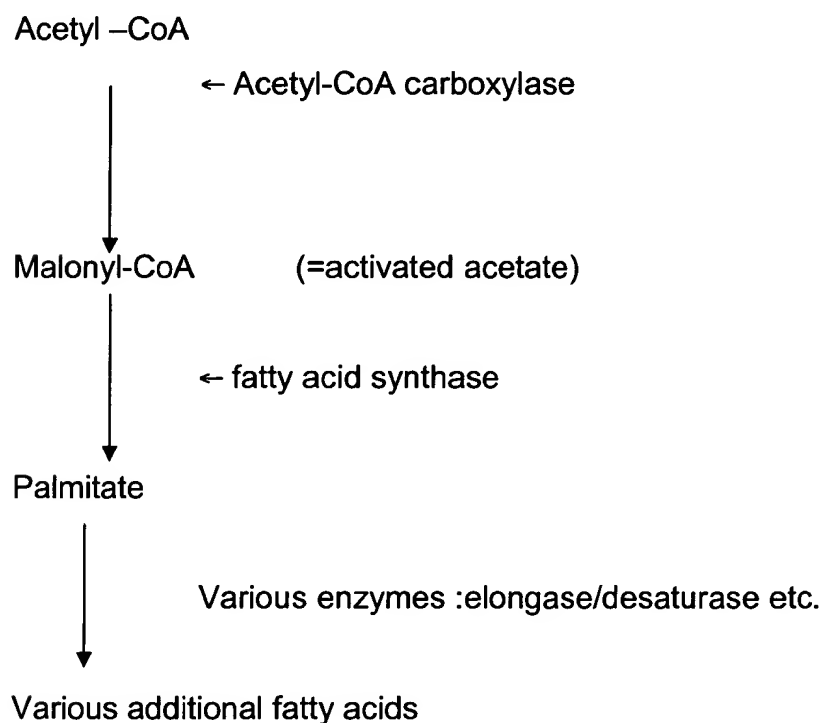
As far as the Examiner purports that the presently claimed invention should be limited to tobacco plants, Applicants respectfully disagree with the Examiner's position for the following reasons.

It is well known in the plant art that all plant cells must produce fatty acids in order to survive, since fatty acid synthesis is essential for plant growth. Moreover, fatty acids are the major constituents of cell membranes. Inhibitors of fatty acid synthesis are lethal to plant cells. Furthermore, all plant cells produce fatty acids from acetyl-CoA by a common pathway. To start fatty acid synthesis acetyl-CoA is transduced into malonyl-CoA by addition of carbon dioxide. To proceed with fatty acid synthesis both acetyl-CoA and malonyl-CoA are needed.

The production of fatty acids in plants requires the provision of acetyl Co-A, which is provided to the plastid in the plant cells via 4 known pathways. These pathways include the activation of free acetate to acetyl Co-A by acetyl CoA synthetase, which is an ATP dependent reaction; the formation of Acetyl-CoA by pyruvate dehydrogenase complex which also generates NADH; a plastidial carnitine acetyltransferase reaction in which acetate is transferred from acetyl-carnitine to CoA; and an ATP-citrate lyase reaction.

Once acetyl Co-A is formed, it is carboxylated to malonyl-CoA by acetyl-CoA carboxylase. Acetyl-CoA and malonyl-CoA are subsequently converted into fatty acids by a series of reactions that add two carbon atoms at a time to a growing chain.

Thus, in plants, a simplified version of fatty acid biosynthesis is the following:



Branched chain fatty acids are basically produced from saturated or in some instances from unsaturated fatty acids. As can be seen from attached Annex I, the pathway of fatty acid synthesis in plants is well known. Palmitic acid is the sole and

fundamental “precursor” formed prior to the formation of longer fatty acids, which are produced in plants. Thus, the Examiners contention that each plant species differs with respect to the availability of precursor fatty acids is not correct.

Furthermore, it cannot be denied that various enzymes are necessary to produce different fatty acids. The presence of specific enzymes in plant cells would naturally result in specific fatty acids being produced.

Moreover, the specification clearly teaches one skilled in the art how to make the recombinant constructs with cyclopropane fatty acid synthase, the transformation of plant cells with this recombinant, the producing of plants with this recombinant, as well as the analysis of the plant material for the branched chain fatty acids.

Applicants submit that it would therefore not be undue experimentation for the person skilled in the art to produce branched chain fatty acids in plants other than tobacco, since the sole precursor for different fatty acid synthesis is palmitate which is present in a variety of plants. Furthermore, fatty acid synthesis is necessary for the survival of plants and hence this biological pathway in plants would not be consistently inhibited by feedback mechanisms in healthy plant cells. Therefore the presence of a cyclopropane fatty acid synthase would naturally produce branched fatty acids in plant cells.

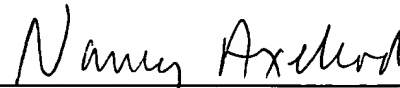
Hence, Applicants submit that the presently claimed invention should not be limited to tobacco cells, for the reasons set forth above.

Thus, in view of the above, withdrawal of this rejection is respectfully requested.

From the foregoing, favorable action in the form of a Notice of Allowance is respectfully requested and such action is earnestly solicited.

Please charge our Deposit Account No. 22-0261 in the amount of \$120.00 covering the fee set forth in 37 CFR 1.16(f). The Director is hereby authorized to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) to our Deposit Account No. 22-0261, under Order No. 31640-159397.

Respectfully submitted,



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